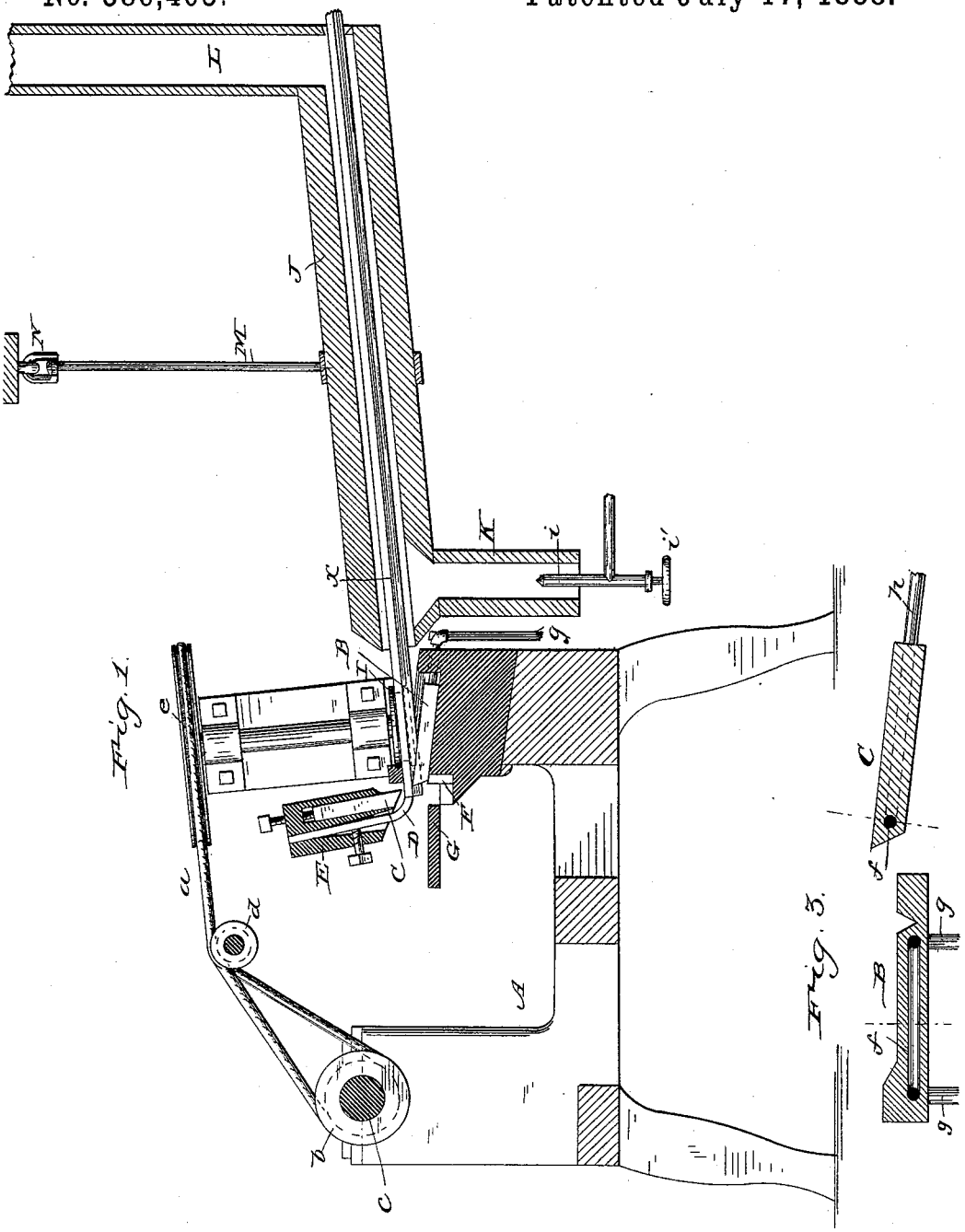
(No Model.) 2 Sheets—Sheet 1.

J. T. JONES.

MACHINE FOR MAKING NAILS AND SPIKES.

No. 386,405. Patented July 17, 1888.



Witnesses:
Ewell A. Rock.
J. Walter Blandford.

Inventor:
John T. Jones.
by Marcellus Bailey,
his atty.

(No Model.) 2 Sheets—Sheet 2.

J. T. JONES.

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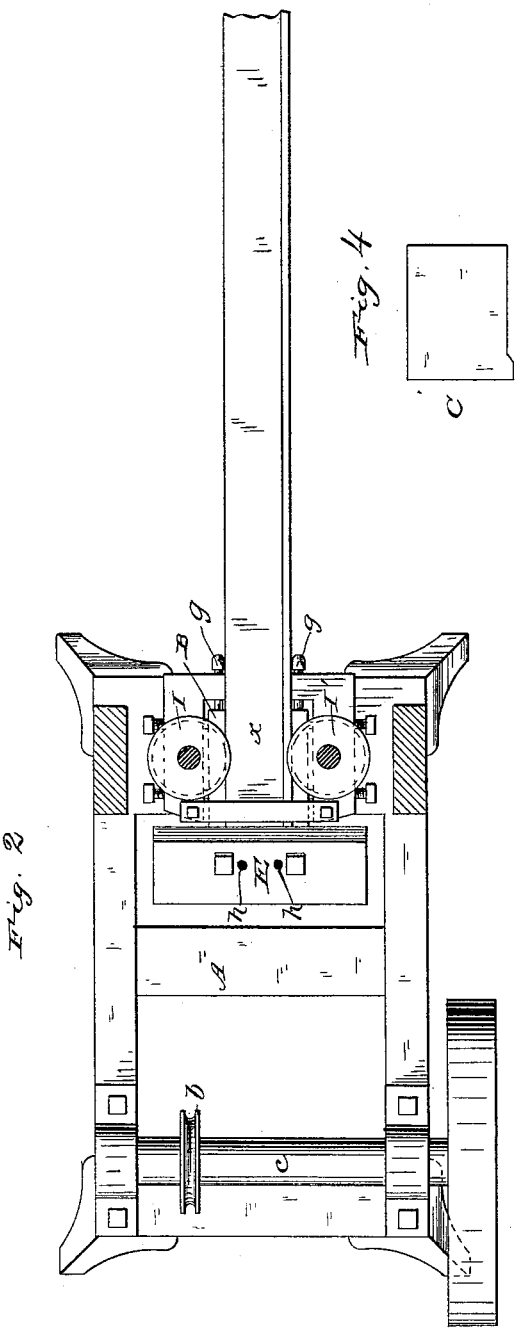

Fig. 2

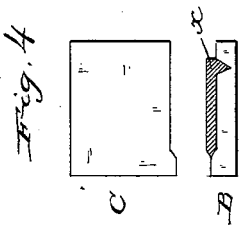

Fig. 4

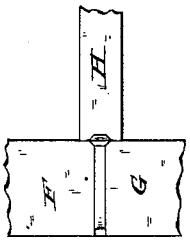

Fig. 5

Witnesses:
Ewell & Dick
J. Walter Blandford

Inventor:
John T. Jones,
by Marcellus Bailey,
his atty.

UNITED STATES PATENT OFFICE.

JOHN T. JONES, OF IRON MOUNTAIN, MICHIGAN, ASSIGNOR OF ONE-HALF TO PETER L. KIMBERLY, OF SHARON, PENNSYLVANIA.

MACHINE FOR MAKING NAILS AND SPIKES.

SPECIFICATION forming part of Letters Patent No. 386,405, dated July 17, 1888.

Application filed November 30, 1883. Serial No. 113,179. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. JONES, of Iron Mountain, in the county of Menominee and State of Michigan, have invented certain new and useful Improvements in Machinery for the Manufacture of Spikes, Nails, &c., of which the following is a specification.

My invention has relation to machinery or apparatus to be used in the manufacture of spikes, nails, &c., produced by cutting them from a long plate-blank, which is fed gradually to cutters or knives arranged to operate substantially as in nail-machines of usual and well-known type. It has been devised more particularly with reference to the needs of such manufacture when the plates or blanks from which the nails, &c., are cut are made of hard steel—such, for instance, as old steel rails or the fag-ends of steel rails. A plate of this kind is extremely hard and soon injures and disables any steel knives or cutters which operate on it.

It is mainly my object to so treat the blank as it is fed along to the knives or cutters that the portions of it successively acted on by the cutters shall be in a condition most favorable to permit the cutting operation to be performed with facility and with as little injury as possible to the knives. To this end I combine with the nail-cutting mechanism a heater, through which the blank passes to the cutting mechanism, said heater being arranged to gradually heat and bring to the proper temperature successive portions of the blank as it is fed along, so that these portions, as they are presented to the cutters, will be in a state to permit the cutting operation to be performed under the most favorable conditions. I further arrange the heater so that it can be moved or swung aside whenever it is desired to get at the knives for sharpening or adjusting or other purposes; and I also provide for the circulation of water or other cooling instrumentality through both the moving knife and the bed-knife, so that they may not be injuriously affected by the hot steel blank, which at the point where the knives operate on it is usually at a bright-red heat. These and other features of my invention can best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal central section, partly in elevation, of machinery embodying my improvements in their preferred form. Fig. 2 is a plan of the same, partly in section, with the heater removed. Fig. 3 represents in section the bed-knife and the moving knife. Fig. 4 represents these knives in position to show more clearly the shape of their cutting-edges. Fig. 5 is a plan view, detached, of the gripping and heading dies.

The parts of the cutting mechanism are supported in a suitable frame, A. B is the bed-knife, set, as usual, on an incline. C is the moving knife. D is the gage, and E is the stock which carries both the moving knife and gage. These parts are all arranged to operate in the usual way, and are actuated by the well-known instrumentalities employed for the purpose in nail-machines of the ordinary type. I have not deemed it necessary, therefore, to represent the stock supporting and guiding standards or the mechanism for actuating or reciprocating said stocks.

The spike or nail as it is cut from the blank is caught between the stationary die F and moving die G, and is headed by the heading-die H. These dies also are well known, and I have not deemed it necessary to illustrate them in detail, nor to represent the mechanism for actuating them.

The feed mechanism shown in the drawings is the one which I, on the whole, now prefer to use. It consists of a pair of rolls, I I′, revolving on vertical axes—or axes at about right angles to the face of the blank—and adapted to grip between them the longitudinal edges of the blank, which latter is represented at *x*. This arrangement of feed-rolls is adapted particularly to a blank like the one shown, which must be presented to the knives in a highly-heated condition. These feed-rolls may be driven by any suitable instrumentalities. I find that it will be sufficient to drive one of them—as, for instance, I—by a belt, *a*, which goes from a pulley, *b*, on a continuously-revolving power-driven shaft, *c*, over a tightening-roller, *d*, to and around a pulley, *e*, on the axle of roll I. The tension of the belt is so adjusted that it can slip on pulley *e* when the moving knife is down, thus permitting roll I to stop at the time the knife is in the path of the blank. The other roll, I′, revolves by frictional con-

tact with the opposite edge of the moving blank, against which it is held with yielding or spring pressure, obtained by backing its bearings with springs. The spring used for this purpose may be a rubber block or buffer arranged in the usual way, to give the roll capacity to yield.

With a view to prevent the bed and moving knives from being injuriously affected by the high heat of the blank, they are made hollow, or are provided with interior passages, as indicated at *f*, said passages communicating with inlet and outlet pipes *g h*, which should be flexible. Water is continuously supplied through the inlet-pipes, and after circulating through the dies is discharged through the outlet-pipes.

It now remains to describe the heater, the preferred arrangement of which is shown in the drawings. As there represented, it consists of a tubular conduit, J, which in practice is made of iron lined with fire brick or clay, and is from six to ten feet in length usually. This conduit—which is open from end to end—is of a size to comfortably accommodate the blank which passes through it.

For a spike-blank such as shown in the drawings the guideway would be, say, eight inches wide and four inches high. The front end of the heater is in as close proximity as practicable to the knives. At or near its front there opens into it an elbow-pipe, K, in the outer open end of which is supported a gas-burner, *i*, provided with a controlling-valve, *i'*, and supplied with gas through a pipe, *j*, having a flexible connection with a source of gas supply. This device, in effect, constitutes a Bunsen burner. The gas issues from the burner, passing in inflamed state to the interior of the heater J, and carrying with it its proportionate supply of air, which enters through the outer end of the pipe K. The flame impinges against the blank at or near the front end of the heater, and thence passes rearwardly through the heater around or over the blank therein to the chimney L, which is provided at the rear end of the heater. The greatest heat is of course at the front of the heater, and is applied to that part of the blank nearest the knives. Under this arrangement, as the blank is fed along through the heater, successive portions of it are gradually raised to a heat sufficient to maintain the blank at the cutting-point at a bright-red heat. The heater, as above said, is brought as near as possible to the knives, and in this position prevents convenient access to the latter.

In order to permit the knives to be readily got at whenever it is required to sharpen or adjust them, I make the heater movable to and from the cutting mechanism. One convenient arrangement for the purpose is to support it by a hanger, M, which at the top is swiveled to the part N, by which it is upheld. This arrangement permits the heater to be swung or turned into and out of line with the bed-plate, as desired. When it is in line therewith, it can be held in that position by any suitable lock, catch, or detent, if such should be found necessary. By means of a mechanism such as described I am enabled to operate upon a steel blank of considerable length, say twenty or thirty feet long. This blank is fed through the heater to the knives, and successive portions of it as it is fed along are gradually brought to such a heat that at the cutting-point the blank is always in a condition most favorable for the cutting operation.

The blank shown in the drawings is a railway-spike blank having a cross-section corresponding in shape and dimensions to the outline of the finished spike, as seen in Fig. 4. The bed and moving knives have cutting-edges shaped to correspond with the shape of the faces of the blank, opposite which they are respectively. The spike, after being cut off, drops between and is gripped by the dies F G, and has formed on it by the heading-die H the side ears or flanges, which permit it to be taken hold of by the tool used to draw it out from the wood into which it may be driven.

I wish it to be understood, in conclusion, that while I have described what I believe to be the best way on the whole of carrying my invention into practical effect, yet I do not restrict myself to the special details herein set forth in illustration of said invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. The heater through which the blank passes to the knives, and in which it is heated to the extent needed to maintain it at the required heat at the cutting-point, in combination with the knives and the feed-rolls arranged and operating to grip between them the longitudinal edges of the heated blank, the combination being and acting substantially as hereinbefore set forth.

2. In nail or spike making apparatus, the combination, with the cutting-knives, of a heater movable to and from said knives and provided with a passage along through which the blank is fed to the knives, substantially as and for the purposes hereinbefore set forth.

3. The combination, with the cutting-knives, of the swinging heater provided with a passage for the blank and adapted to be turned into and out of line with the knives, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 28th day of November, 1883.

JOHN T. JONES.

Witnesses:

EWELL A. DICK,

J. WALTER BLANDFORD.